Historical Perspectives

Egyptian Contributions to Cardiovascular Medicine

James T. Willerson, MD
Rebecca Teaff, MA

Ancient Egypt was one of the greatest civilizations to have arisen, becoming the cradle of scientific inquiry and social development over 3 millennia.[1]

Ancient Egypt

Many concepts in cardiovascular medicine may be directly traced to practices of ancient Egypt. With their discovery of papyrus, the Egyptians made possible the preservation of the written word; they also became experts at embalming and preserving the human body. The Egyptians left us many artifacts of historical importance—tombs, pottery, depictions, hieroglyphics, and mummies. Evidence from these artifacts, along with the writings of ancient historians, reveals an educated society in early Egypt with an intense interest in the sciences, humanities, and medicine.

Records of Egyptian history begin with the Old Kingdom, around 3000 BC (Table I).[1] The great pyramids were probably constructed during this period. For the next few centuries (6th to 11th dynasties), there was a weakening of a strong central government in Egypt. It was partially reestablished during the 11th and 12th dynasties, which marked the Middle Kingdom (2035-1668 BC). This period has been called the "Classical Age" as an indication of its high intellectual emphasis, and medicine apparently held a prominent place in the pursuit of learning.[2]

Around the 13th century BC, Ramesses II, builder of the great temple of Abu Simbel, was pharaoh. The Biblical story of the enslavement of the Hebrews probably dates from this period. In succeeding centuries, Egypt fell under the ruling authority of several countries, including Libya, Ethiopia, Assyria, and finally, Persia.[2] In 323 BC, Alexander the Great, the Macedonian Greek conqueror, defeated Persia and chose his general Ptolemy to take the throne as king of Egypt. There, Alexander founded the city of Alexandria, which became the medical and intellectual capital of the Mediterranean world.[2]

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From: *The Department of Cardiovascular Research, Texas Heart Institute; and the Division of Cardiology, Department of Internal Medicine, The University of Texas Medical School–Houston; Houston, Texas 77030*

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Address for reprints:
James T. Willerson, MD, Division of Adult Cardiology, Texas Heart Institute, 1101 Bates, Rm. P-335 (Mail Code 1-102), Houston, TX 77030

The Heart

In attempting to explain primordial medical systems, Henry Sigerist concluded that "physiology began when man . . . tried to correlate the action of food, air, and blood."[3] The Egyptians found the focal point of this correlation in the heart, which they regarded as the central organ in the body, essential to the living and the dead.[4]

The hieroglyph that represented the heart was 1st drawn with vessels attached to it, but after the 3rd Dynasty this symbol was considerably modified and acquired the traditional shape of a heart-shaped jar (Fig. 1). The heart was regarded as the organic motor of the body and the seat of intelligence, emotions, and desire; theologians even explained creation as being the making of "the heart that conceives" and of "the tongue that commands."[5] The heart thus came to be held responsible for human emotions. Because the Egyptians regarded the heart as the body's principal organ, absolutely essential to life, they failed to recognize its role as a potential seat of disease.[6]

Medical Papyri

The word *papyrus* refers to a paper reed, *Cyperus papyrus*, which was a plant cultivated in ancient times in the Nile Delta region of Egypt (Fig. 2). With the

TABLE I. Dynasties of Ancient Egypt and Equivalent Time Periods

Dynasty	Period	Approx Date BC
I-II	Archaic	3168-2705
III-VI	Old Kingdom	2705-2250
VII-X	1st Intermediate	2250-2035
XI-XIII	Middle Kingdom	2035-1668
XIV-XVII	2nd Intermediate	1720-1550
XVIII-XX	New Kingdom	1550-1070
XXI-XXXI	Late Period	1070-332
Ptolemaic	Greek Period	332-30
Emperors	Roman Period	30 BC-395 AD

(Source: Sullivan R.[1] Reprinted from the *Journal of the Royal Society of Medicine.*)

invention of the alphabet and the conversion of the papyrus into a vehicle for preserving the written word, the transmission of knowledge was greatly accelerated. The reliance on the oral passage of information and its clay and stone substitutes was abolished forever.[7]

The most enlightening sources describing the Egyptians' knowledge of the cardiovascular system are to be found in several papyri, named after their discoverers: the (Edwin) Smith Surgical Papyrus, the (Georg) Ebers Papyrus, and the (Heinrich) Brugsch Papyrus. These papyri form a representative sample of the world's 1st body of medical literature.

Reliance on the writings of Greek and Roman commentators, such as Homer, Herodotus, and Hippocrates, was necessary for knowledge of ancient Egyptian medicine until the discovery of the Rosetta Stone in 1799 during Napoleon's conquest of Egypt. Though the writings of the Egyptians were abundant in historic ruins, they had been virtually undecipherable until this discovery provided the keys essential for translation.

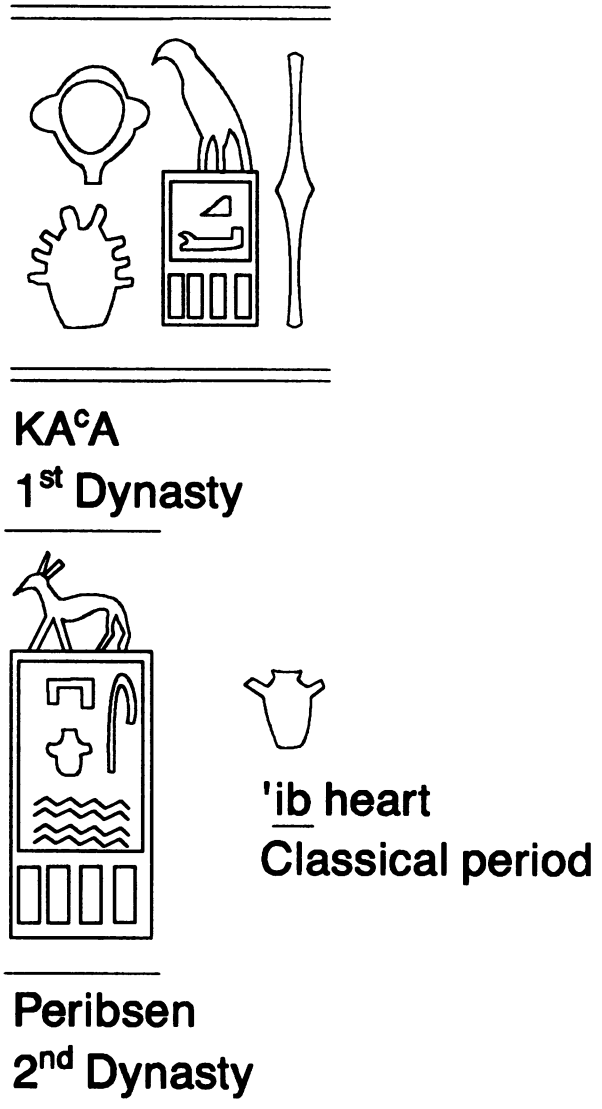

Fig. 1 *Various ways of depicting the heart at different epochs.*

(Source: Iskandar AZ. A catalogue of Arabic manuscripts on medicine and science in the Wellcome Historical Medical Library. London: Wellcome Historical Medical Library, 1967. Original drawing adapted by Melissa J. Mayo, Texas Heart Institute.)

The Smith Papyrus

The Smith Surgical Papyrus (ca. 17th century BC) provides important insights into the state of surgical knowledge in ancient Egypt. Discovered at Thebes in 1862 and purchased by Edwin Smith, an American Egyptologist, the document remained obscure until 1920, when Smith's daughter bequeathed it to the New York Historical Society. Although it was dated at 1600 BC, the Smith Papyrus is believed to have been copied from a much older document, originally written around 2500 BC. (Some historians have dated it as far back as 3000 BC.) Published in 1930 with a translation and commentary by James Henry Breasted, the original is now housed in the New York Academy of Medicine.

The Smith Papyrus contains descriptions of 48 mostly traumatic surgical cases. It follows a logical pattern, starting at the head and working down, but the text abruptly stops at mid-chest. The format has been likened to a series of clinical presentations rather than a "how to" text.[8] Each surgical case is given a title, followed by a description of the method of examination. On the basis of the examination, which includes interrogation, inspection, palpation, and the observation of movements performed at the direction of the "surgeon," a diagnosis is reached.[9] The diagnosis is preceded by 1 of 3 assessments: "an ailment which I will treat"; "an ailment with which I will contend"; or "an ailment not to be treated."[9,10]

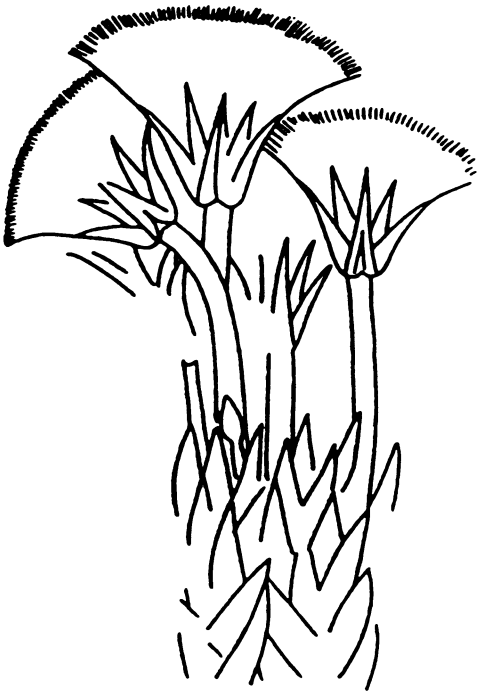

Fig. 2 Cyperus papyrus, *from which papyrus is derived.*

(Source: Manniche L. An ancient Egyptian herbal. Austin: University of Texas Press, 1989.)

The 1st type of ailment is considered curable. For the 2nd, therapy is instituted, even though the surgeon may have doubts about the potential for cure. The 3rd verdict is serious: in such a case, the surgeon refrains from immediate therapy and restricts himself to watching, waiting, and thoroughly observing the patient.[9] Treatments are limited to the following choices: 1) mechanical or surgical treatment, 2) a combination of surgical treatment and external medicines, and 3) external medicines only.

Hieroglyphic characters in the Smith Papyrus represent the 1st written observations of the heartbeat (Fig. 3). This document also presents what may be the 1st description of the circulation of the blood, preceding the Greek Democritus's crude description of the circulation in his treatise *On Nutrition*[11] by over 2 millennia.[1] In addition, the document contains a glossary, explaining some of the terminology from the Old Kingdom.[9]

The initial words of the Smith Papyrus show the Egyptians' belief in a direct correlation between the pulse and the heart:[12]

> The counting of anything with the fingers (is done) to recognize the way the heart goes. There are vessels in it leading to every part of the body. . . . When a Sekhmet priest, any *sinu* doctor . . . puts his fingers to the head . . . to the two hands, to the place of the heart . . . it speaks . . . in every vessel, every part of the body.

In actual practice, the pulse was counted with the aid of an earthenware vessel that acted as a clock (Fig. 4). This vessel had a tiny hole in the bottom from which water escaped, drop by drop. The pulse rate was determined by correlating the beats with the drops of water.

The Ebers Papyrus

The Ebers Papyrus (ca. 1555 BC), at more than 100 pages the longest intact papyrus, contains the greatest amount of material relating to internal medicine, including a treatise on the heart and vessels (Fig. 5). The heart is again described in this papyrus as being the center of a system of vessels supplying the body.

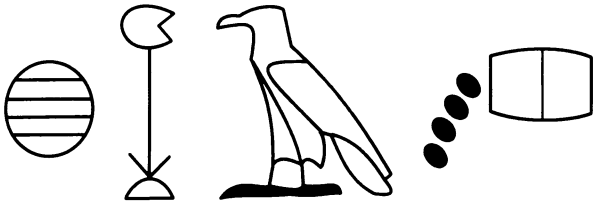

Fig. 3 *Counting or measurement of the pulse as depicted by hieroglyphic characters in the Smith Papyrus. The symbol on the right represents seeds being emptied from the container.*

(Photo source: University of Central Florida. Literary source: Breasted JH. The Edwin Smith Surgical Papyrus. Chicago: University of Chicago Press. Original drawing adapted by Melissa J. Mayo, Texas Heart Institute.)

Fig. 4 *Egyptian clock.*

(Photo source: National Library of Medicine. Literary source: Brewer LA. Sphygmology through the centuries: historical notes. Am J Surg 1983;145:696-701. Used with permission.)

The Ebers Papyrus was written approximately 1500 years after the Smith Papyrus, but it lacks the coherence and careful organization found in the latter. The best known translation is by B. Ebbell in 1937.

The unknown physician who recorded his observations in what came to be known as the Ebers Papyrus used the phrase, "to measure the heart in order to recognize its indications." Most Egyptologists agree that "to measure the heart" refers to counting the pulse. Recognition of a direct correlation between the pulse and the heart can be found in this papyrus:[13]

> From the heart arise the vessels which go to the whole body . . . if the physician lay his finger on the head, on the neck, on the hand, on the epigastrium, on the arm or the leg, everywhere the motion of the heart touches him, coursing through the vessels to all the members. . . . When the heart is diseased, its work is imperfectly performed; the vessels proceeding from the heart become inactive so that you cannot feel them. . . . If the heart trembles, has little power and sinks, the disease is advancing.

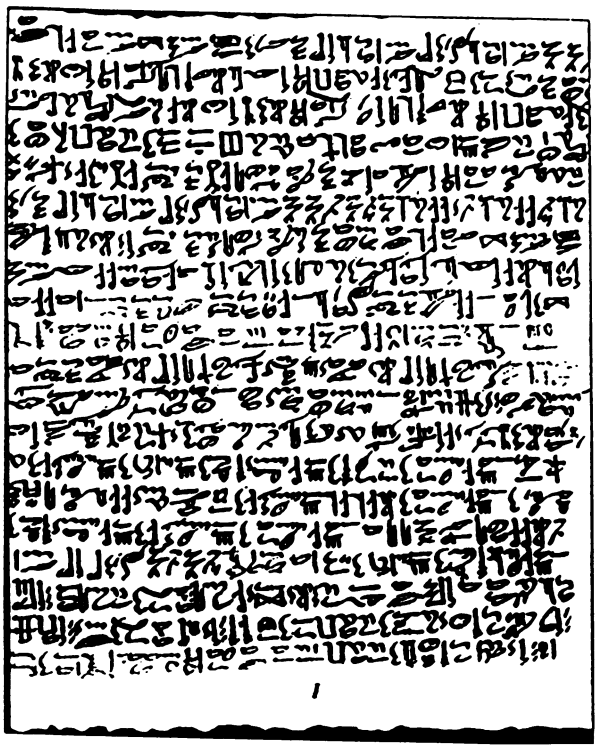

Fig. 5 *Ebers Papyrus.*

(Photo source: National Library of Medicine. Literary source: Wreszinski W. Atlas zur Altaegyptischen Kulturgeschichte. Leipzig: JC Henrichs Buchhandlung, 1914-1946. Used with permission.)

Though ventricular fibrillation, as we know it today, was probably 1st described by J.E. Erichsen in 1842,[14] the latter part of the preceding passage—according to medical historians—may also be a description of ventricular fibrillation. The keys here are the trembling of the heart and the lack of pulsation: important features of ventricular fibrillation.

Also contained in the Ebers Papyrus are instructions regarding the diagnosis of tumors and descriptions of a type of "vessel-tumor," which may not have been a blood vessel. Tumors are described as coming from the wound of a vessel. The writer recommends that surgical removal of a tumor be done by use of a knife that has been heated in a fire, in order to reduce the amount of bleeding. So it appears that the actions of cutting and cauterizing were done simultaneously.[12] The papyrus also contains a description of "serpentine windings," which were probably varicose veins.

The Brugsch Papyrus

The Brugsch Papyrus, which is also known as the Greater Berlin Papyrus, contains a description of the heart similar to that found in the Ebers Papyrus; it also presents a superficial description of the anatomy of the veins. Heinrich Brugsch discovered this document in a jar during excavations at Saqqara early in the 20th century.[15,16] It is dated between 1350 and 1200 BC. Translated and published by Walter Wreszinski in 1909, it is now housed in the Berlin Museum.[12] Some historians believe that this papyrus is referenced in the writings of Galen.[7]

The Evolution of Medical Practice and Teaching

Gods of Healing

In early times, the ruling kings of Egypt were regarded as gods, but they retained human qualities, as did the cosmic gods.[2] Although all the deities were associated with some aspect of health or illness, no god was devoted only to medicine until later in Egyptian history (Fig. 6). Then, each specialization in medicine had a patron god or goddess, and the physicians worked directly under the auspices of their own particular deity.

The 2 most important healing divinities were Thoth, who became a patron god of physicians (as the source of medical knowledge) and of scribes (as the inventor of writing), and Imhotep, whom Sir William Osler called "the first figure of a physician to stand out clearly from the mists of antiquity."[17]

Imhotep was a multi-talented individual—scribe, poet, architect, and chief physician of the Pharaoh Djoser (3rd Dynasty). During the Greek period, he was deified and identified with Asklepios, the Greek god of healing, and with the Roman counterpart,

Fig. 6 *Nineteenth-dynasty physician Iwty shown seated with scroll on lap in pose reminiscent of representations of Imhotep, the god of medicine.*

(Photo source: Rijks Museum van Oudheden, Leiden. Literary source: Lyons AS, Petrucelli RJ II. Ancient Egypt. In: Medicine: an illustrated history. New York: Harry N Abrams, 1978. Used with permission.)

Aesculapius. Imhotep apparently wrote about both architecture and medicine; although none of his writings has survived, some historians believe that he is the author of the material on which the Smith Papyrus is based. The greatest architectural legacy attributed to Imhotep is the building of the great step pyramid at Saqqara (ca. 2650 BC). This necropolis was the 1st pyramid built in Egypt, and it is also believed to be the oldest large-scale stone building in the world.

The Medical Hierarchy

Organized medical care began with the Egyptians at the time of Imhotep. The medical hierarchy started with the *swnw* (ordinary doctor),* *imyr swnw* (overseer of doctors), *wr swnw* (chief of doctors), *smsw swnw* (eldest of doctors), and *shd swnw* (inspector of doctors).[18]

There is also evidence of women physicians: 1 relief describes Pereshet as *imy-rt-swny*, lady director of lady physicians. However, this is the only known reference to suggest that women held medical posts.

In 425 BC, the Greek physician Herodotus described the practice of medicine among the Egyptians in terms of specialization:[19]

> The practice of medicine they split into separate parts, each doctor being responsible for the treatment of only one disease. There are, in consequence, innumerable doctors, some specializing in diseases of the eye, others of the head, others of the stomach, and so on; while others, again, deal with the sort of troubles which cannot be exactly localized.

Although, according to the Egyptian scholar J. Worth Estes,[20] it is unlikely that the Egyptian physicians actually were divided in terms of specialization, some may have earned reputations for treating specific conditions, such as inflammation around the eye. Specialization in terms of internal organs would have been unlikely, since the *swnw* assumed that almost all types of illnesses arose from 1 underlying cause.

Taking an accurate history of the patient was an essential component of Egyptian medicine even though the questioning was somewhat limited by a lack of knowledge of anatomy and physiology. Symptoms such as palpitation, dyspnea, and pain were commonly pursued. William Heberden the elder is traditionally given credit for 1st describing angina pectoris, but the Egyptians anticipated him by 4,000 years with a classic and dramatic description of coronary ischemia:[21]

> If thou examinest a man for illness in his cardia and he has pains in his arms, and in his breast and in one side of his cardia . . . it is death threatening him.

Cyanosis, one of the more important clinical signs of congenital heart disease, was also described by the ancient Egyptians (Fig. 7). The earliest illustration of a blue-skinned person was taken from the tomb of Osiris, dating from about 2000 BC. The Smith Papyrus presents convincing evidence (Fig. 8) that cyanosis was observed even earlier than this illustration indicates.

Medical Teaching

After the golden age of the papyri, no record of Egyptian medical practice exists for more than a thousand years. Several explanations have been

**Swnw* is probably pronounced something like "sounou."

given for this void, one being the repeated havoc of wars and invasions.[5] Another is that the teaching and practice of medicine were conveyed largely through an oral, rather than a written, tradition.

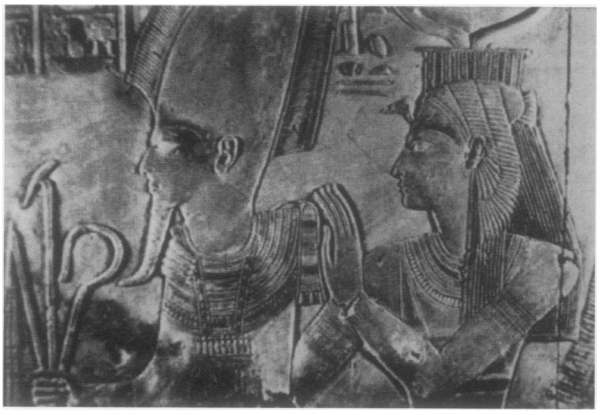

Fig. 7 *Earliest illustration of a blue-skinned person.*

(Photo source: National Library of Medicine. Literary source: Rashkind WJ. Historic aspects of congenital heart disease. Birth defects. Original Article Series, 1972:8 [Fig. 5]. Used with permission.)

In the 6th century BC, the great temples of Egypt were destroyed. Then reconstruction began, and Houses of Life were built. In Sais, the House of Life was reconstructed and attached to the temple. Here, priest-physicians were trained in rational medicine, in addition to mysticism. Their education was largely secret, and orally conveyed. Some scholars believe that these Houses of Life were forerunners of medical departments in our modern universities.

By the 3rd quarter of the 4th century AD, hospitals had been established as independent institutions for the care and treatment of the sick. According to Van Minnen,[22] the birth of the hospital was the 1 medical revolution to occur in late antiquity. Egyptian documents reveal a multitude of hospitals that were founded by private individuals and were independent of ecclesiastical institutions. Apparently, the hospital as a singular institution also helped to resolve major tensions between medical, ecclesiastical, and religious orders of ancient times.[22]

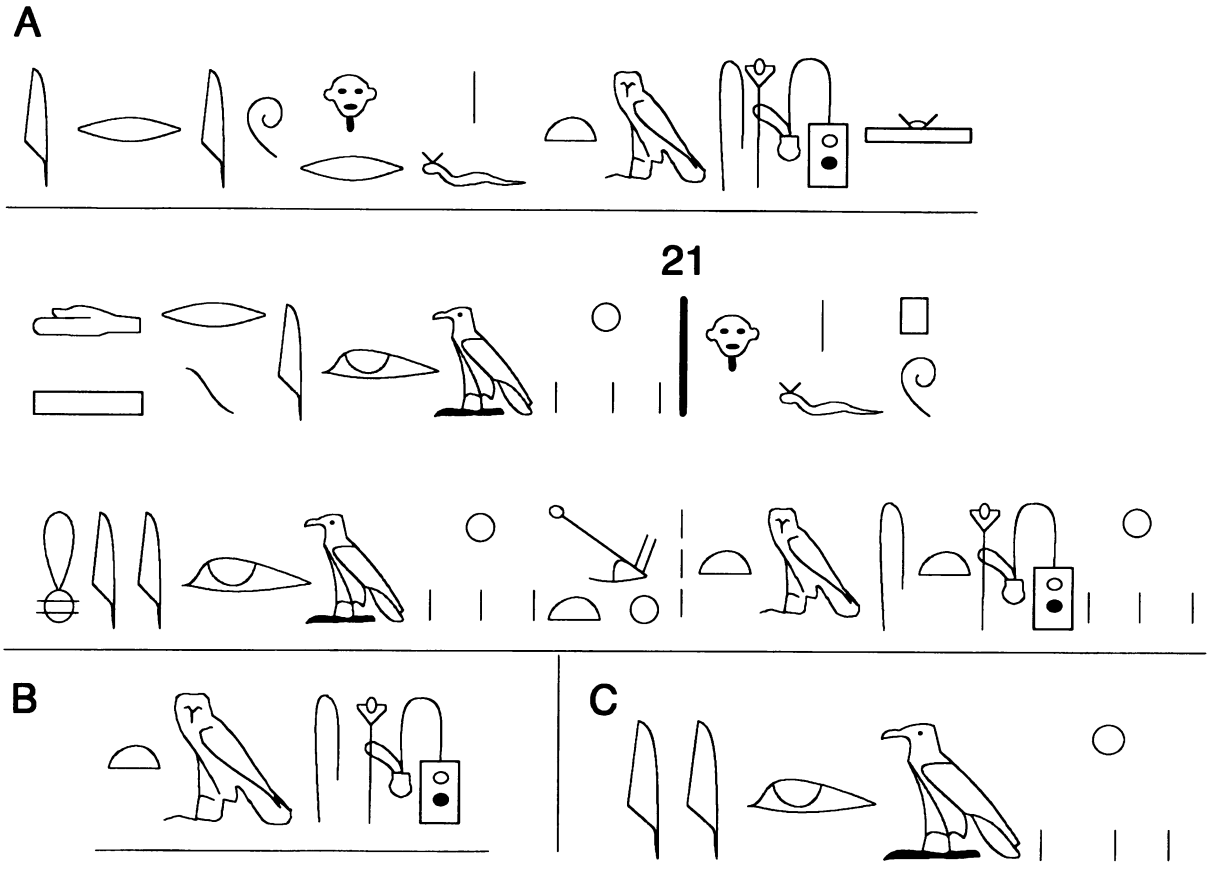

Fig. 8 *In this hieroglyph from the Smith Papyrus, "B" describes a color that is reddish, while "C" indicates a color that is bluish. Some Egyptologists believe that the intended color was based on the medical practitioners' description of cyanosis. It is a mixture of red and blue.*

(Photo source: National Library of Medicine. Literary source: Rashkind WJ. Historic aspects of congenital heart disease. Birth defects. Original Article Series, 1972:8 [Fig. 8]. Original drawing adapted by Melissa J. Mayo, Texas Heart Institute. Used with permission.)

Medical Scholars

Some 300 years after the rebuilding of the temples, only 40 miles from Sais, Alexander built Alexandria. After his death, the Ptolemies started a grand tradition, making their city an international emporium of trade and ideas that attracted the finest scholars in the world. Two of these exceptional scholars, Herophilus and Erasistratus, distinguished the arteries from the veins, differentiated arterial from venous blood, and nearly discovered the circulation.[5] It is difficult to determine their exact influences, but these 2 Greek scientists may have been inspired by the papyri kept in the vast libraries of Alexandria and Memphis, for according to Galen, Greek physicians still studied there in the 2nd century AD. After these important discoveries, nearly 13 centuries passed, dominated by the figure of Galen.

Then, in 13th-century Cairo, Ibn al-Nafis wrote a *Commentary on the Anatomy of Avicenna*, in which he flatly refuted the ideas of both Galen and the Arab philosopher and physician Avicenna. The Egyptian scholar Paul Ghalioungui has examined the contributions of al-Nafis, which are summarized as follows:[5]

- He claimed that the blood runs from the right to the left ventricle through the lungs and not through the septal pores as Galen had imagined.
- He denied the existence of 3 ventricles, as asserted by Aristotle and Avicenna.
- Importantly, he opposed the view that the heart is nourished by a sediment left by the blood in the right ventricle—that the heart obtains its nourishment from the blood that runs in its substance. This was actually the 1st description of the coronary circulation, and it was written long before the work of William Harvey, who is commonly thought to be the author of this discovery.
- He stated that the walls of the pulmonary veins are thin in order to facilitate the reception of what comes out of the pulmonary artery through perceptible pores between the 2. This perception was the nearest he could get to the capillary circulation before the invention of the microscope and the description of the capillary circulation by Malpighi. It completed his theory of the lesser circulation.

According to Ghalioungui, there is now proof that from the death of Ibn al-Nafis in 1288 until the 17th century, when Harvey's *De motu cordis* was published, the views of Ibn al-Nafis were widely publicized in several well-known Arabic treatises. One can be found in the Paris Bibliothèque Nationale. Ghalioungui is convinced that some connection between Ibn al-Nafis and Harvey exists—at least that Harvey owed something to this important predecessor.

Mummification

Arterial degenerative disease was not uncommon in ancient times, as noted from the extensive examinations of Egyptian mummies (Fig. 9). The Egyptian Museum in Cairo houses one of the largest collections of mummies in the world, and the only collection of royal mummies.[23]

The *swnw* probably learned nothing of medical value from the mummification process because, for climatic and religious reasons, anatomic investigations were not carried out on cadavers.[20] In addition, the embalmers had a low rank in society, which precluded their participation in "scholarly activities" with those in more learned professions.[20] Though there is some evidence that physicians themselves performed autopsies, the descriptions of the heart and vessels in the papyri were based more on speculation than on pure observation.

Modern diagnostic techniques, including radiography, computed tomography, electron and light microscopy, serology, and endoscopy, have all been applied to the study of ancient Egyptian remains. Although mummification involved practically complete removal of the intrathoracic and intra-abdominal organs, the heart was well preserved. This was due to religious beliefs at the time, which mandated that the heart remain with the dead to safeguard them in the afterlife. Remnants of the aorta and its major branches were thus preserved for study by future pathologists.

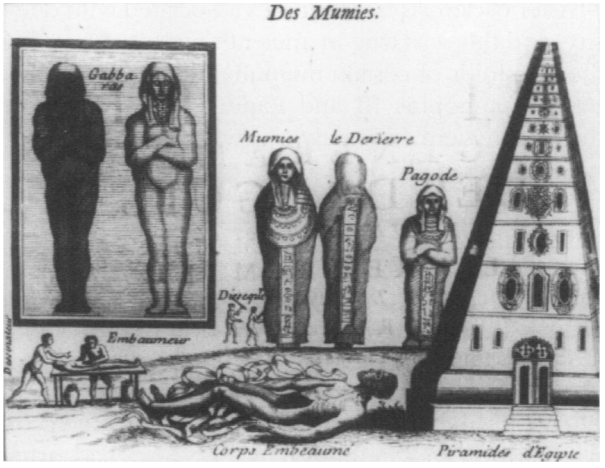

Fig. 9 *Embalming: Egyptian mummies, corpse, pyramids, and the embalming process.*

(Photo source: National Library of Medicine. Literary source: Pomet. Histoire generale des drogues, Paris, 1694. Used with permission.)

Proof that atherosclerosis was present among the early Egyptians was supplied by Sir Marc Armand Ruffer in Cairo in 1911[24] and S.G. Shattock[25] in London during the same period. Interestingly, their observations were independent of each other. Ruffer was a member of the medical faculty at Cairo when he published his incredible findings involving an extensive macroscopic and microscopic study of the arterial lesions of Egyptian mummies.[24]

Most of the intrathoracic and intra-abdominal arteries were destroyed during the almost complete evisceration of the body undergoing mummification. However, there were enough remnants, both there and in the limbs, for Ruffer to describe the lesions of atherosclerosis in various stages of development and appearance. His observations included the soft atheromatous lesions, the calcified plaques, the ulcers, and even the type of sclerosis that Mönckeberg described so well in 1903.

Ruffer was also able to demonstrate that the sclerotic changes were not the exclusive prerogative of the elderly. He used Aristotle's method of estimating age to determine the degree of hardening of the cartilaginous tissues. Thus he was able to roughly assess the age of the mummies under study, and thereby note atherosclerotic lesions even in younger people. Ruffer's work was closely aligned in time with Shattock's description of atherosclerotic lesions in the mummy of Menephtah, who was a pharaoh in Biblical times. When examined, Menephtah's mummy revealed that he had died in old age, with an obese abdomen and arteriosclerosis of the aorta.[2] Observation of the head showed tortuous, calcified temporal arteries.[26] The father of Menephtah, the Pharaoh Ramesses II, lived until he was more than 90 years old (Fig. 10).

Arteriosclerosis is sometimes associated with obesity, and this was true in ancient times as shown by the skin folds of certain mummies, such as the pharaohs Amenophis III and Ramesses III. Although these men were extremely overweight, their obesity was not generally depicted in their portraits, most likely for reasons of etiquette.[26]

Since the discoveries of Ruffer, numerous other mummies, whose ages at death ranged from the 4th to the 8th decades, have shown similar vascular changes. According to 1 observation published by Long in 1931[27] regarding the mummy of Lady Teye (21st Dynasty), there was evidence of atheromatous disease of the aorta with calcification of the coronary artery and mitral valve. She also had arteriosclerosis of the kidney, which would have contributed to a serious rise in blood pressure. She was estimated to have been about 50 years old at the time of her death. By the 1960s, modern histologic methods were used to examine and photograph the arteries of mummies[28] (Fig. 11).

Fig. 10 *Radiograph showing anterior aspect of the knees of Ramesses II. Note the calcification of the popliteal arteries at their bifurcation (arrows).*

(Source: Whitehouse WM. Radiologic findings in the royal mummies. In: Harris JE, Wente EF, editors. An x-ray atlas of the royal mummies. Chicago: University of Chicago Press, 1980. Used with permission.)

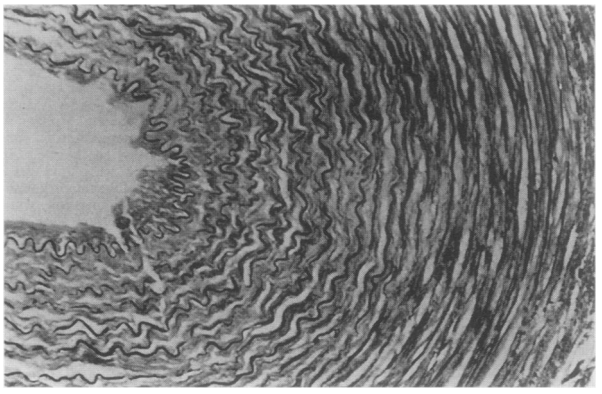

Fig. 11 *Carotid artery of a male mummy showing fibrosis. Verhoeff-van Gieson stain.*

(Source: Sandison AT. Diseases in ancient Egypt. In: Cockburn A, Cockburn E, editors. Mummies, disease, and ancient cultures. Cambridge: Cambridge University Press, 1980. Used with permission.)

Pharmacopeia

The early Egyptian physicians were aware of a variety of abnormal cardiac conditions, including arrhythmia, aneurysm, congestive heart failure, and venous insufficiency. Therapeutic remedies derived from plants have been an important element of pharmacopeias throughout the ages (Fig. 12).[29] Since nearly 700 drugs filled the ancient Egyptian pharmacopeia, some must have had specific applications to cardiovascular conditions, but those treatments

Fig. 12 *Girl holding clusters of dates. Dates had many medicinal applications in ancient times, including treatment for certain heart ailments.*

(Source: Manniche L. An ancient Egyptian herbal. Austin: University of Texas Press, 1989.)

remain unknown.[21] Mention of the oldest known cardiac glycoside-containing plant, squill, is to be found in the Ebers Papyrus. Neither the actual chemical composition nor its action on the heart was known at the time; it was used as an ingredient in the preparation of antidotes to poison.

Mysticism, Magic, and Medicine

In the ancient world, religion, magic, and medicine were intertwined. The heart was thought capable of recording all the good and evil acts performed by a human being during life. At the time of judgment, the heart was weighed on a scale against a feather (Fig. 13). A virtuous heart would prove light, winning its possessor eternal salvation, while a sinful heart would prove heavy and be cast to the crocodiles of the Nile, forever damning its owner.[30]

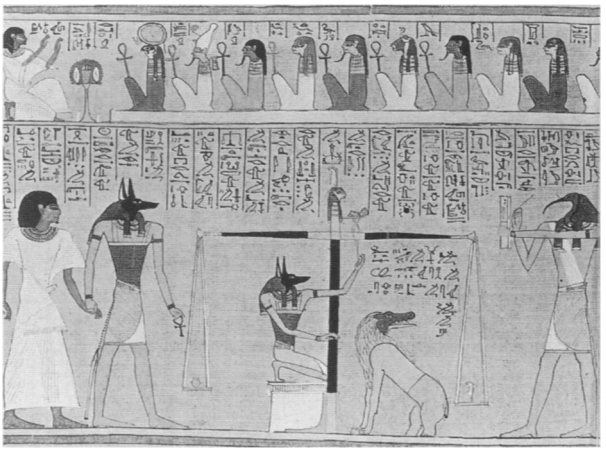

Fig. 13 *Scene from the 19th Dynasty (1307-1196 BC) Book of the Dead papyrus of Hunefer (London, British Museum) showing the deceased led in by Anubis, and his heart weighed against a feather. A 2nd figure of Anubis checks the balance, while the "Eater" stands ready and Thoth records the result. In the small register above, Hunefer (the deceased) adores a group of deities.*

(Source: Baines J, Málek J. Atlas of ancient Egypt. New York: Facts on file, 1982.)

Although the earliest roots of Western medicine lie in Mesopotamia, the Egyptians nurtured and expanded the art of healing with great national fervor and pride. Egyptian physicians were respected and consulted throughout the ancient world. In Greece, it was said that to have studied medicine in Egypt was the highest credential a physician could present.[21]

Physicians in ancient Egypt faced limited therapeutic options, but the papyri suggest that they practiced in an extremely caring and supportive fashion. Patients and their disorders were not to be ridiculed, and dying patients were to be treated with great compassion. The ultimate admonition was emphasized through frequent repetition: "Do not abandon him."[31]

Though it was often mixed with mythology, mysticism, and theology, the science of the early Egyptians represented a major step from superstition to the scientific foundations of Greek and Roman medicine, and beyond. It is undeniable that the early Egyptian physicians developed skills of observation, physical examination, clinical diagnosis, and surgery, that foreshadowed many developments in modern medicine.

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